CHRISTENSON, DONALD R., AND M. B. BUTT, Crop and Soil Sciences Department, Michigan State University, East Lansing, MI 48824. - Differential response of sugarbeet to applied nitrogen following corn and navy bean.

Crop rotations affect the amount of crop residues returned to the soil and the amount of nitrogen needed for sugarbeet. This study was conducted to determine the effect of nitrogen rate on sugarbeet yield and quality when sugarbeet followed corn compared to following navy bean. Sugarbeet plots in a long term cropping systems study were split and 4 nitrogen rates (0, 40, 80, and 120 lb N/acre) were applied. Leaf area during the growing season and yield and quality at harvest were measured. Leaf area of beets 14 weeks after planting following corn was approximately 70% of when following navy beans. Increasing nitrogen rate did not compensate for the slower growth. Yield of sugarbeet was 3 tons less following corn at 80 lb N/acre and 2 tons less at 120 lb N/acre. Recoverable sugar was 730 and 350 lb/acre less at 80 and 120 lb rates, respectively. Preliminary evidence suggests that sugarbeet requires 30 lb N/acre following navy beans than following corn. However, it does not appear that the difference can be completely compensated for with additional nitrogen. Earlier evidence showed that an interaction between carry-over Bladex used on corn and Pyramin used on sugar beet may be a factor in the yield difference. Sugarbeet following corn had more fibrous roots and smaller leaves than following navy beans. Greenhouse data showed a decrease in fibrous root:tap root dry weight ratio when Bladex and Pyramin were applied to sugarbeet.